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(54) "FLOOR COVERING COMPOSITION, HAVING A PLASTER BASE"

(71) We, H. & E. BORGARDTS KG, a Company organised under the laws of the German Federal Republic, of 3425 Walkenried Post Box 108, Federal Republic of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The present invention relates to a floor covering composition having a plaster base.

15 Coating compositions for the production of continuous floor covering from a cement, plaster, trass and lime mortar material which hardens after application have been known for a long time. As early as in the Middle Ages and in Classical times, floor coverings without any joints were produced from plaster-containing compositions. But in modern times the production of plaster floor covering compositions have presented difficulties since it is not possible, as it was previously, for flooring compositions produced from highly burned anhydrite II obtained from natural gypsum rock, to be left lying for a long time after processing with water until complete reaction had taken place.

25 The use of anhydrite II coming from gypsum occurring in the chemical industry is also difficult since it is first of all necessary to grind the anhydrite to a very fine particle sizes, and finally requires strong activators for its transformation into the dihydrate, and also hydration takes place very slowly and therefore the floor has to be left lying for a long time before it is possible to walk on it. In addition, the working of the composition on the building site makes it necessary to calculate the quantities of binder, activator and other additional materials, since serious damage can be caused if quantities exceed or go below the required amounts. Furthermore when using anhydrite II, both kinds of difficulty can occur owing to the fact that the

floor covering composition dries out too quickly, so that non-hydrated anhydrite particles remain in the composition. But when moisture is subsequently taken up, the hydration then continues, so that stresses may take place in the structure which result in considerable damage.

It has also been proposed to use alpha calcium hemihydrate for the production of floor covering compositions. But this modification of the hemihydrate has the disadvantage that it is subjected to considerable expansion during working, amounting to up to 0.5% lineary, whereas 0.1% at the most can be allowed.

Beta hemihydrate would be available as a further modification for the production of a floor covering composition having a plaster base. Beta hemihydrate has a considerably lower expansion but again has the disadvantages of low strength values, which is just as disadvantageous for use as a floor covering composition.

Therefore, the present invention has as its object to obviate these problems which occur in the production of floor covering compositions having a plaster base, and to provide a floor covering composition having a plaster base which has the necessary strength for flooring, has a considerably lower expansion value than 0.1% which can be applied in a more convenient way, but in contrast to anhydrite can be walked over after only a few hours.

According to the present invention there is provided a composition having a plaster base comprising a mixture of 0.4 to 1.5% by weight of liquefier, as hereinbefore defined, 0.001 to 0.05% by weight of setting retarding agent as hereinbefore defined, 5 to 20% by weight of fat lime hydrate (Ca(OH)₂) and correspondingly 94.599 to 78.45% being alpha calcium sulphate hemihydrate.

This composition is prepared in the usual way with the addition of water in a quantity

which is sufficient for producing a floor covering composition capable of being worked, stirred, and cast at the desired place.

Such a composition is preferably produced by the manufacturer except for the addition of building sand, that is to say the manufacturer supplies a mixture comprising alpha hemihydrate, liquefier, retarding agent, and fat lime, whereas the building sand is added at the building site in a weight ratio of 1:1.

A preferred composition of a plaster-containing part is as follows: 0.2% by weight of retarding agent, 1.0% by weight of liquefier, 20.0% by weight of fat lime hydrate, and 78.8% by weight of alpha hemihydrate of a particle size up to 2mm.

The term retarding agent as herein used is understood to mean a substance which is known in the plaster-working trades and which delays the time taken for a plaster to set. A particularly well-known retarding agent is for example "Retardan" the use of which makes it possible to delay the hardening of a plaster by several hours depending on the quantity of retarding agent added.

A liquefier as used herein is understood to mean a compound or substance which is capable of allowing economies in mixing water in the composition. An example of such a liquefier is a highly condensed, high-molecular, water-soluble aminoplast having a melamine-formaldehyde base, modified at at least one NH group by sulphite or sulphonic acid groups or by inorganic or organic amides. Water-soluble polysilicic acids are also suitable.

For floor covering compositions which are to withstand heavy loads or rough treatment, the mixture containing alpha hemihydrate can also contain a plaster hardener, for example aluminium sulphate in powder form, and in a quantity of 0.5% by weight in relation to the mixture containing the hemihydrate. But instead of aluminium sulphate it is also possible to use Portland cement which is added in quantity of 5.0% by weight. The building sand is added at the building site in a weight ratio of 1:1.

The production of the alpha hemihydrate is carried out in a manner known *per se*, the raw gypsum being crushed to a particle size of 2 to 15 cm, then dehydrated in a known manner in a saturated water vapour atmosphere under pressure, in fact to water of crystallisation content of 5 to 6% by weight. The burned material thus obtained is then ground in suitable grinding installations to a particle size up to 2.0 mm and the alpha hemihydrate thus obtained is used in the mixture indicated hereinbefore.

The floor covering compositions produced from this material can be walked over three hours after pouring, as already stated. They have a high strength value and can take

considerable loads, and linear expansion is substantially below 0.1%.

WHAT WE CLAIM IS:—

1. A composition having a plaster base comprising a mixture of 0.4 to 1.5% by weight of liquefier, as hereinbefore defined, 0.001 to 0.05% by weight of setting retarding agent as hereinbefore defined, 5 to 20% by weight of fat lime hydrate ($\text{Ca}(\text{OH})_2$) and correspondingly 94.599 to 78.45% being alpha calcium sulphate hemihydrate.

2. A composition according to Claim 1, in which the liquefier is a highly condensed, high molecular, water-soluble aminoplast having a melamine-formaldehyde base, modified at at least one NH_2 group by by sulphite or sulponic acid groups or by inorganic or organic amides.

3. A composition according to Claim 1, in which the liquefier is a water-soluble polysilicic acid.

4. A floor covering composition having a plaster base comprising a composition according to any of Claims 1 to 3 and a building sand in the weight ratio of 1:1.

5. A floor covering composition according to Claim 4 in which the particle size of the building sand is up to 3 mm.

6. A floor covering composition according to Claim 5 in which the plaster composition has a plaster hardener added to it.

7. A floor covering composition according to Claim 6 in which the plaster hardener is aluminium sulphate in powder form and the quantity thereof amounts to 0.5% by weight of the plaster composition.

8. A floor covering composition according to Claim 6 in which Portland cement is added as plaster hardener in a quantity of 5.0% by weight of the plaster composition.

9. A method of producing a plaster base composition according to any of Claims 4 to 8 in which the composition comprising 0.4 to 1.5% by weight of liquefier, as hereinbefore defined, 0.001 to 0.05% by weight of setting retarding agent as hereinbefore defined, 5 to 20% by weight of fat lime hydrate ($\text{Ca}(\text{OH})_2$) and correspondingly 94.599 to 78.45% being alpha calcium sulphate hemihydrate, is mixed and packed and the building sand is packed separately for adding to the composition mixture.

10. A method according to Claim 9 in which the liquefier is a highly condensed, high molecular, water-soluble aminoplast having a melamine-formaldehyde base, modified at at least one NH_2 group by sulphite acid groups or by inorganic or organic amides.

11. A method according to Claim 9 in which the liquefier is a water-soluble polysilicic acid.

12. A composition having a plaster base,
according to Claim 1, substantially as
hereinbefore described.

5 13. A floor covering composition having a
plaster base, according to Claim 4, sub-
stantially as hereinbefore described.

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